

Recommendation 1

Recent investments by the United States in new and upgraded facilities have positioned the Nation to continue its world-leadership role in nuclear science. The highest priority of the nuclear science community is to exploit the extraordinary opportunities for scientific discoveries made possible by these investments. Increased funding for research and facility operations is essential to realize these opportunities.

Specifically, it is imperative to

- Increase support for facility operations – especially our unique new facilities RHIC, CEBAF, and NSCL – which will greatly enhance the impact of the nation's nuclear science program.
- Increase investment in university research and infrastructure, which will both enhance scientific output and educate additional young scientists vital to meeting national needs.
- Significantly increase funding for nuclear theory, which is essential for developing the full potential of the scientific program.

Recommendation 2

The Rare Isotope Accelerator (RIA) is our highest priority for major new construction. RIA will be the world-leading facility for research in nuclear structure and nuclear astrophysics.

The exciting new scientific opportunities offered by research with rare isotopes are compelling. RIA is required to exploit these opportunities and to ensure world leadership in these areas of nuclear science.

RIA will require significant funding above the nuclear physics base. This is essential so that our international leadership positions at CEBAF and at RHIC be maintained.

Recommendation 3

We strongly recommend immediate construction of the world's deepest underground science laboratory. This laboratory will provide a compelling opportunity for nuclear scientists to explore fundamental questions in neutrino physics and astrophysics.

Recent evidence for neutrino mass has led to new insights into the fundamental nature of matter and energy. Future discoveries about the properties of neutrinos will have significant implications for our understanding of the structure of the universe. An outstanding new opportunity to create the world's deepest underground laboratory has emerged. This facility will position the U.S. nuclear science community to lead the next generation of solar neutrino and double beta-decay experiments.

Recommendation 4

We strongly recommend the upgrade of CEBAF at Jefferson Laboratory to 12 GeV as soon as possible.

The 12 GeV upgrade of the unique CEBAF facility is critical for our continued leadership in the experimental study of hadronic matter. This upgrade will provide new insights into the structure of the nucleon, the transition between the hadronic and quark/gluon description of matter, and the nature of quark confinement.